

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 (original). A method of designing a permanent magnetic structure for generating a desired magnetic field in a region of interest (ROI) comprising;

- setting the dimensions of the permanent magnetic structure
- setting a hypothetical distribution of magnetic material over the surface of said structure for each member of a finite set of spatial frequency harmonics of unit magnetisation amplitude
- calculating the magnetic field in the ROI from each member of said set
- calculating amplitudes of said harmonics by the method of least squares in order to achieve the optimum approximation to the desired field in the ROI
- scaling the members of said set according to said optimised harmonic amplitudes
- establishing, by summing said scaled members, the required distribution of magnetic material in order to generate the desired magnetic field.

2 (original). A method according to claim 1 wherein the desired field represents a modification of an existing magnetic field.

3 (original). A method according to claim 2 wherein the desired field represents the deviation from a required field generated by an existing magnetic structure.

4 (original). A method according to claim 3 wherein the desired field represents one of the harmonics of the magnetic field over the ROI.

5 (original). A method according to claim 4 wherein each said harmonic results in a shim, to create a set of shims representative of the weighted sum of the individual harmonics.

6 (currently amended). A method according to ~~any of claims 1 to 5~~ claim 1 wherein the desired field is produced by a distribution of magnetic material over one or more flat surfaces.

7 (currently amended). A method according to ~~any of claims 1 to 5~~ claim 1 wherein the desired field is produced by a distribution of magnetic material over an elliptical cylindrical shell.

8 (currently amended). A method according to ~~any of claims 1 to 5~~ claim 1 wherein the desired field is produced by a distribution of magnetic material over the surface of a circular cylindrical shell.

9 (currently amended). A method according to claim 7 ~~or claim 8~~ wherein the thickness of magnetic material is varied in an azimuthal direction in accordance with the desired field.

10 (original). A method according to claim 1 wherein the desired field is produced by a combination of paramagnetic and diamagnetic materials.

11 (original). A method of designing a permanent magnetic structure for generating a desired magnetic field in a region of interest (ROI) on the basis of the minimization of the sum of the least squares of the deviations over the ROI.

12 (currently amended). A method according to ~~any of claims 1-11~~ claim 1 wherein an additional, hypothetical, arbitrary distribution of magnetic material over said surface is incorporated into said set.

13 (currently amended). A method according to ~~claims 2 or 3~~ claim 2 comprising:

- calculating the distribution of magnetic material to produce an optimum approximation to a desired magnetic field in the ROI, in accordance with the method described herein

- determining the total resultant field in the ROI taking into account the thicknesses and placements of magnetic materials involved

- calculating a corrected magnetic material distribution representative of the difference between said total resultant field and said desired field

- repeating the latter two steps until the field attained approximates the desired one in the ROI to a sufficient degree.

14 (currently amended). A method according to ~~any of claims 1 to 5~~ claim 1 where the magnetic fields of said set of harmonics are evaluated by an actual step involving numerical integration in real space.

15 (currently amended). A method according to ~~any of claims 1 to 5~~ claim 1 where the Fourier transformers of the magnetic fields of said set of harmonics are evaluated directly in Fourier Kernel space.

16 (currently amended). A permanent magnetic structure designed in accordance with the method of ~~any of claims 1 to 15~~ claim 1.